
State: District of Columbia **First Filing Company:** The Hanover American Insurance Company, ...
TOI/Sub-TOI: 20.0 Commercial Auto/20.0000 Commercial Auto Combinations
Product Name: DC- Legacy Auto Filing
Project Name/Number: Commercial Lines/CA /DC-CA-19658

Filing at a Glance

Companies: The Hanover American Insurance Company
Massachusetts Bay Insurance Company
The Hanover Insurance Company

Product Name: DC- Legacy Auto Filing

State: District of Columbia

TOI: 20.0 Commercial Auto

Sub-TOI: 20.0000 Commercial Auto Combinations

Filing Type: Rate/Rule

Date Submitted: 11/13/2019

SERFF Tr Num: HNVR-132139494

SERFF Status: Submitted to State

State Tr Num:

State Status:

Co Tr Num: DC-CA-19658

Effective Date 03/01/2020

Requested (New):

Effective Date 03/01/2020

Requested (Renewal):

Author(s): Jenifer Kochis, Robert Hayden

Reviewer(s):

Disposition Date:

Disposition Status:

Effective Date (New):

Effective Date (Renewal):

State: District of Columbia **First Filing Company:** The Hanover American Insurance Company, ...
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General Information

Project Name: Commercial Lines/CA Status of Filing in Domicile:
Project Number: DC-CA-19658 Domicile Status Comments:
Reference Organization: Reference Number:
Reference Title: Advisory Org. Circular:
Filing Status Changed: 11/13/2019
State Status Changed: Deemer Date:
Created By: Jenifer Kochis Submitted By: Robert Hayden
Corresponding Filing Tracking Number:

Filing Description:

We are filing revisions to our Commercial Automobile line of business for the Hanover Insurance Company, Massachusetts Bay Insurance Company and the Hanover American Insurance Company effective March 1, 2020 for new and renewal business. The overall estimated rate impact is +2.2%.The following revisions are proposed:

- 1.Loss Costs
- 2.Hired Auto Minimum Premium
- 3.Non-Ownership Liability
- 4.Business Auto Coverage Broadening Endorsement Class Code Correction

Company and Contact

Filing Contact Information

Robert Hayden, Associate Compliance Analyst
440 Lincoln Street
Worcester, MA 01653
rhayden@hanover.com
508-855-3138 [Phone] 3138 [Ext]
508-855-4786 [FAX]

Filing Company Information

The Hanover American Insurance Company	CoCode: 36064	State of Domicile: New Hampshire
440 Lincoln Street	Group Code: 88	Company Type: Property & Casualty
Worcester, MA 01653	Group Name: The Hanover Ins Group	State ID Number:
(508) 855-1000 ext. [Phone]	FEIN Number: 04-3063898	

Massachusetts Bay Insurance Company	CoCode: 22306	State of Domicile: New Hampshire
440 Lincoln Street	Group Code: 88	Company Type: Property & Casualty
Worcester, MA 01653	Group Name: The Hanover Ins Group	State ID Number:
(508) 855-1000 ext. [Phone]	FEIN Number: 04-2217600	

The Hanover Insurance Company	CoCode: 22292	State of Domicile: New Hampshire
440 Lincoln Street	Group Code: 88	Company Type: Property & Casualty
Worcester, MA 01653	Group Name: The Hanover Ins Group	State ID Number:
(508) 855-1000 ext. [Phone]	FEIN Number: 13-5129825	

State:	District of Columbia	First Filing Company:	The Hanover American Insurance Company, ...
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Rate Information

Rate data applies to filing.

Filing Method:	File and Use
Rate Change Type:	Increase
Overall Percentage of Last Rate Revision:	6.700%
Effective Date of Last Rate Revision:	02/01/2019
Filing Method of Last Filing:	File and Use
SERFF Tracking Number of Last Filing:	HNVR-131666360

Company Rate Information

Company Name:	Overall % Indicated Change:	Overall % Rate Impact:	Written Premium Change for this Program:	Number of Policy Holders Affected for this Program:	Written Premium for this Program:	Maximum % Change (where req'd):	Minimum % Change (where req'd):
The Hanover American Insurance Company	3.600%	2.600%	\$4,973	11	\$191,260	5.400%	1.500%
Massachusetts Bay Insurance Company	3.600%	2.300%	\$25,437	93	\$1,105,963	74.600%	0.000%
The Hanover Insurance Company	3.600%	2.100%	\$15,173	52	\$722,502	27.200%	0.000%

State:	District of Columbia	First Filing Company:	The Hanover American Insurance Company, ...
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Project Name/Number:	Commercial Lines/CA /DC-CA-19658		

Rate/Rule Schedule

Item No.	Schedule Item Status	Exhibit Name	Rule # or Page #	Rate Action	Previous State Filing Number	Attachments
1		DISTRICT OF COLUMBIA Commercial Automobile State Exception Pages	1-2	Replacement	HNVR-131666360	DC Exception Pages Legacy 20190301.pdf
2		Commercial Lines Manual Division One Automobile Loss Cost Pages	1-3	Replacement	HNVR-131666360	Appendix A - DC Proprietary Loss Cost Pages for Filing - Legacy.pdf

DISTRICT OF COLUMBIA

Commercial Automobile State Exception Pages
The Hanover Insurance Company (HI)
Massachusetts Bay Insurance Company (MB)
The Hanover American Insurance Company (HM)
*Effective Date, New Business and Renewals: **March 1st, 2020***

	ISO Circular	ISO Filing Designation	ISO Effective Date	Hanover Effective Date
Loss Costs*	LI-CA-2011-174	CA-2011-BRLA1	10/1/2011	5/1/2012
Rules	LI-CA-2005-362	CA-2005-ORU01	4/1/2006	4/1/2007
Class Plan	LI-CA-2011-173	CA-2011-RCP1	10/1/2011	5/1/2012
Increased Limits Factors	LI-CA-2018-150	CA-2018-IALL1	10/1/2018	2/1/2019
UM Loss Costs*	LI-CA-2011-174	CA-2011-BRLA1	10/1/2011	5/1/2012
Composite Rating Plan	LI-CA-2017-095	RP-2016-RCP16	8/1/2017	2/1/2018
Retrospective Rating Plan	LI-CA-2017-096	RP-2016-RRP16	8/1/2017	2/1/2018
Experience & Schedule Rating Plans	LI-CA-2012-275	RP-2012-RAL12	4/1/2013	7/1/2016
	LI-CA-2012-276	RP-2012-RPD12	4/1/2013	7/1/2016

*Please see Appendix A for Proprietary Loss Costs for PPTs, TTTs, Publics, and Hired Autos.

Loss Cost Multipliers *

	<u>Hanover</u>	<u>Mass Bay</u>	<u>Han American</u>
Liability/UM/No Fault	1.913	1.722	1.529
Physical Damage	2.023	1.820	1.620

* Final rates are to be determined by multiplying the proprietary loss cost by the multipliers shown above.

[Business Auto Coverage Broadening Endorsement \(461-0155\)](#)

- > This endorsement amends coverage provided under the Commercial Auto Coverage Form CA0001.
- > This endorsement is available for any policy which includes CA0001. Class Code 9990 applies.

1 - 4 Motorized Units	\$125
5 - 10 Motorized Units	\$250
11+ Motorized Units	\$400

- > This endorsement is not subject to any further premium discounts or modifications.

THERE IS NO RENEWAL CREDIT

COMPANY EXCEPTIONS TO ISO STATE INSURANCE MANUAL

8. POLICY-WRITING MINIMUM PREMIUM

The policy-writing minimum premium is [\\$500](#).

89. NON-OWNERSHIP LIABILITY

Class Codes 6638, 6639 and 6640 in table 89.C.1a.(1)(LC) are replaced by the following:

Class Code	Total Number of Employees	Liability Base Loss Cost
6601	0 - 25	\$ 139

90. HIRED AUTOS

B. Cost of Hire Basis - Liability Coverage

3. Premium Computation

g. The minimum premium for hired auto liability coverage at basic limits is **\$75**. If the minimum premium is charged and the cost of hire is not known, use Class Code 6619.

C. Cost of Hire Basis - Physical Damage Coverages

3. Premium Computation

e. The minimum premium for hired auto physical damage coverage is **\$25**. If the minimum premium is charged and the cost of hire is not known, use Class Code 6614.

COMMERCIAL AUTO LIABILITY EXPERIENCE AND SCHEDULE RATING PLAN

Maximum Schedule Debit: 25%
Maximum Schedule Credit: 25%

Rule 2.C Expected Loss Ratio is 46.9%

Rule 2.E Eligibility for Schedule Rating

Paragraph 2.E is replaced by the following:

E. Eligibility for Schedule Rating

Any risk that develops a premium of \$500 for the exposures to be rated shall be eligible for the application of the schedule rating modification provisions of this Plan.

Rule 5.H Actual Experience Ratio

The following is added to Paragraph 5.H:

If the experience modification is a credit, the maximum allowable credit is limited to 25%.
If the experience modification is a debit, the maximum allowable debit is limited to 25%.

COMMERCIAL AUTO PHYSICAL DAMAGE EXPERIENCE AND SCHEDULE RATING PLAN

Maximum Schedule Debit: 25%
Maximum Schedule Credit: 25%

Rule 2.B Expected Loss Ratio is 41.2%

Rule 2.D Eligibility for Schedule Rating

Paragraph 2.D is replaced by the following:

D. Eligibility for Schedule Rating

Any risk that develops a premium of \$500 for the exposures to be rated shall be eligible for the application of the schedule rating modification provisions of this Plan.

Rule 5.F Experience Modification

The following is added to Paragraph 5.F:

If the experience modification is a credit, the maximum allowable credit is limited to 25%.
If the experience modification is a debit, the maximum allowable debit is limited to 25%.

COMMERCIAL LINES MANUAL
DIVISION ONE
AUTOMOBILE
LOSS COST PAGES
THE HANOVER INSURANCE COMPANY
MASSACHUSETTS BAY INSURANCE COMPANY
THE HANOVER AMERICAN INSURANCE COMPANY

DISTRICT OF
COLUMBIA (08)
TERRITORY 101

LIABILITY	
Limit of Liab. \$100,000	
RULE 23. TRUCKS, TRACTORS AND TRAILERS CLASSIFICATIONS	
	\$ 694
RULE 32. PRIVATE PASSENGER TYPES CLASSIFICATIONS	
	\$ 484
RULE 40. PUBLIC AUTO CLASSIFICATIONS -	
- TAXICABS AND LIMOUSINES	\$ 4,303
- SCHOOL AND CHURCH BUSES	\$ 382
- OTHER BUSES	\$ 2,637
- VAN POOLS	\$ 1,041
<ul style="list-style-type: none"> • For liability increased limits factors, refer to Rule 100. • For liability fleet factors, refer to Rules 22. and 39. • For Medical Payments, refer to Rules 49. and 92., as applicable. 	

**COMMERCIAL LINES MANUAL
DIVISION ONE
AUTOMOBILE
LOSS COST PAGES
THE HANOVER INSURANCE COMPANY
MASSACHUSETTS BAY INSURANCE COMPANY
THE HANOVER AMERICAN INSURANCE COMPANY**

**DISTRICT OF
COLUMBIA (08)
TERRITORY 101**

PHYSICAL DAMAGE Original Cost New Range \$15,001 - 20,000			
	Specified Causes Of Loss	\$500 Ded. Comp.	\$500 Ded. Coll.
RULE 23. TRUCKS, TRACTORS AND TRAILERS CLASSIFICATIONS			
- Local And Intermediate - All Vehicles			
- Long Distance - Light Trucks and Trailers Used with Light Trucks			
	\$ 55	\$ 77	\$ 216
RULE 32. PRIVATE PASSENGER TYPES CLASSIFICATIONS			
	N/A	\$ 89	\$ 370
RULE 40. PUBLIC AUTO CLASSIFICATIONS			
- TAXICABS AND LIMOUSINES			
	\$ 56	\$ 79	\$ 274
- SCHOOL AND CHURCH BUSES			
	\$ 39	\$ 54	\$ 140
- OTHER BUSES			
	\$ 39	\$ 54	\$ 140
- VAN POOLS			
	\$ 56	\$ 79	\$ 274
<ul style="list-style-type: none"> • For physical damage fleet factors, refer to Rules 22. and 39. • For additional coverages, refer to the Additional Coverages Table in Rules 23. and 40. • For Deductible factors, refer to Rule 98. • For Original Cost New and Age Group factors, refer to Rule 101. • For Stated Amount factors, refer to Rule 101. • For Towing and Labor Costs Coverage rating, refer to Rule 34. 			

90. HIRED AUTOS

Cost of Hire Basis - All Territories
Liability Base Loss Cost
\$1.21

Table 90.B.3.b.(LC) Cost Of Hire Basis Liability Loss Cost

(The remainder of the Hired Auto loss costs are unchanged.)

State:	District of Columbia	First Filing Company:	The Hanover American Insurance Company, ...
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Supporting Document Schedules

Bypassed - Item:	Consulting Authorization
Bypass Reason:	N/A - we are not a third party filer
Attachment(s):	
Item Status:	
Status Date:	

Satisfied - Item:	Actuarial Certification (P&C)
Comments:	
Attachment(s):	Motor Vehicle Ins. Rate & Rule Filing Certification~Legacy.pdf
Item Status:	
Status Date:	

Satisfied - Item:	District of Columbia and Countrywide Experience for the Last 5 Years (P&C)
Comments:	
Attachment(s):	DC Experience Worksheet - Legacy.pdf
Item Status:	
Status Date:	

Satisfied - Item:	District of Columbia and Countrywide Loss Ratio Analysis (P&C)
Comments:	
Attachment(s):	Exhibit 1 - State Indication.pdf
Item Status:	
Status Date:	

Satisfied - Item:	Support Documents
Comments:	
Attachment(s):	IRR Memo & Exhibits.pdf Exhibit 2 ~ Legacy.pdf
Item Status:	
Status Date:	

Satisfied - Item:	Explanatory Memo
Comments:	
Attachment(s):	DC Explanatory Memo - Legacy.pdf
Item Status:	

SERFF Tracking #:	HNVR-132139494	State Tracking #:		Company Tracking #:	DC-CA-19658
State:	District of Columbia	First Filing Company:	The Hanover American Insurance Company, ...		
TOI/Sub-TOI:	20.0 Commercial Auto/20.0000 Commercial Auto Combinations				
Product Name:	DC- Legacy Auto Filing				
Project Name/Number:	Commercial Lines/CA /DC-CA-19658				
Status Date:					

**DISTRICT OF COLUMBIA
DEPARTMENT OF CONSUMER AND REGULATORY AFFAIRS
INSURANCE ADMINISTRATION**

MOTOR VEHICLE INSURANCE RATE AND RULE FILING CERTIFICATION

A. Name of company or rating organization and mailing address:

The Hanover American Insurance Company

The Hanover Insurance Company

Massachusetts Bay Insurance Company

B. Date of Filing: _____ Proposed Effective Date 3/1/2020

C. Private Passenger Automobile _____

Commercial Automobile X

Notes: _____ A Premium Survey Form must be attached to every private passenger automobile filing.

_____ All following questions shall be answered in reference to the type of insurance, private passenger or commercial, checked above.

_____ All information shall be for the District of Columbia only, unless otherwise specified.

D. Briefly state the purpose of this filing.

With this filing, we are revising our proprietary loss costs for PPT, TTT, Public, and Hired Auto vehicle types. These loss costs will mirror those filed in ISO reference filing CA-2019-BRLA1. We are also updating Hired Auto minimum premiums, adopting Non-ownership Liability subject to our system limitations and typo correction on BA Coverage Broadening Endorsement class code.

E. Is this an independent filing No a "me too" filing No or a filing related to the approved filing of a rating organization Yes?

If not an independent filing, specify the approval date and reference number (if applicable) of the related filing.

F. List all rate level changes for the District for the last five years:

<u>Effective Date</u>	<u>Overall Rate Level Change</u>
<u>7/1/2016</u>	<u>5.6%</u>
<u>2/1/2018</u>	<u>8.4%</u>
<u>2/1/2019</u>	<u>6.7%</u>
_____	_____
_____	_____
_____	_____

G. Show the growth in the number of policies in force in the District of Columbia over the last five years:

<u>Number Of Policies In Force As Of December 31st</u>					
	<u>Voluntary</u>		<u>Assigned</u>	<u>Grand</u>	<u>Percent</u>
	<u>New</u>	<u>Renewal</u>	<u>Risk</u>	<u>Total</u>	<u>Growth</u>
5th Prior Year 20 <u>14</u>	<u>7</u>	<u>70</u>	<u>0</u>	<u>77</u>	<u>XXX</u>
4th Prior Year 20 <u>15</u>	<u>10</u>	<u>80</u>	<u>0</u>	<u>90</u>	<u>17%</u>
3rd Prior Year 20 <u>16</u>	<u>3</u>	<u>87</u>	<u>0</u>	<u>90</u>	
2nd Prior Year 20 <u>17</u>	<u>9</u>	<u>99</u>	<u>0</u>	<u>108</u>	<u>20%</u>
1st Prior Year 20 <u>18</u>	<u>18</u>	<u>108</u>	<u>0</u>	<u>126</u>	<u>17%</u>

- H. Show the maximum and minimum rate level effect of this filing by coverage. These effects shall illustrate the maximum filing by coverage. These effects shall illustrate the maximum increase (or smallest decrease) and minimum increase (or largest decrease) which will result to any insured from the proposed changes to rates and rating factors.

The calculation of these effects shall be: the proposed change in the base rate, times the maximum (or minimum) change to each rating factor affecting that coverage.

For instance, a rate revision could include changes to classification factors, increased limit factors, deductible relativities, and model year/symbol factors.

For bodily injury, the maximum change would be the base rate change times the maximum change to classification factors times the maximum change to increased limits factors. The minimum change would be the base rate change times the minimum change to each of these rating factors. For collision coverage, a similar calculation would be done using different rating factors.

<u>Coverage</u>	<u>Percentage Rate Level Changes</u>	
	<u>Minimum</u>	<u>Maximum</u>
Bodily Injury	--	--
Property Damage	--	--
Collision	0.0%	6.0%
Comprehensive	0.0%	0.0%
Uninsured Motorists	0.0%	0.0%
Towing and Labor	0.0%	0.0%
Personal Injury Protection		
Other (Combined Single Limit + Med Pay)	0.0%	95.2%
All	0.0%	0.0%

- I. Please provide information on the actuarial supporting data:

(1) Calendar Year

Accident Year	see Exhibit 1
Policy Year	
Other (Specify)	

Basic Limits

Total Limits	see Exhibit 1
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If total limits data has been provided, specify the part of the filing which illustrates how large losses have been considered:

Exhibit 1, pages 1-3. Incurred Losses are limited to \$250,000 and a large loss (percent of premium) load is applied based on our statewide loss experience.

- (2) All rate filings shall mathematically consider investment income, pursuant to D.C. Code, Section 35-1703 (h), 1981 Edition (as amended). Specify the part of the filing which mathematically determines investment income:

See Investment Income Exhibit

- (3) Please provide a chart showing the number of earned exposures for each coverage and each year of experience. See Exhibit 2

- (4) Please provide a chart showing the actual written premium by coverage which was used to calculate the overall percentage rate change. See Exhibit 2

- J. The following data should be part of the data submitted on page 14 of the Annual Statement for the most recent two years for the District of Columbia; only voluntary (not assigned risk) business shall be shown:

<u>Coverage</u>	<u>Most Recent Year (2018)</u>			
	<u>Direct Premiums</u>		<u>Direct Losses</u>	
	<u>Written</u>	<u>Earned</u>	<u>Paid</u>	<u>Incurred</u>
Bodily Injury				
Property Damage				
Uninsured Motorist				
Other Liability (CSL + Med Pay)	1,281,741	1,031,957	122,283	112,629
Total	1,281,741	1,031,957	122,283	112,629
Personal Injury Protection	33,745	28,576	5,171	81,384
Collision				
Comprehensive				
Other Physical Damage	689,179	533,516	224,442	14,838
Total	1,970,920	1,565,473	1,970,920	1,970,920

Prior Year (2017)

	Direct Premiums		Direct Losses	
<u>Coverage</u>	<u>Written</u>	<u>Earned</u>	<u>Paid</u>	<u>Incurred</u>
Bodily Injury				
Property Damage				
Uninsured Motorist				
Other Liability (CSL + Med Pay)	1,127,632	1,031,957	122,283	112,629
Total	1,127,632	1,031,957	122,283	112,629
Personal Injury Protection	30,624	28,576	5,171	81,384
Collision				
Comprehensive				
Other Physical Damage	604,486	533,516	224,442	14,838
Total	1,762,742	1,594,049	351,896	208,851

Underwriting Income/Earned Premiums	-3.7%
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As an authorized representative of this Company or rating organization, I hereby certify that to the best of my knowledge and belief the attached filing complies with all applicable laws, regulations, and bulletins of the District of Columbia.

Levi Kamenetsky, FCAS

NAME OF AUTHORIZED REPRESENTATIVE

Lee Kammholz

SIGNATURE

AVP, Commercial Auto

TITLE

508-855-4021

TELEPHONE NUMBER

DISTRICT OF COLUMBIA EXPERIENCE WORKSHEET

District of Columbia

	20 <u>14</u>	20 <u>15</u>	20 <u>16</u>	20 <u>17</u>	20 <u>18</u>
Written Premium	<u>1,311,735</u>	<u>1,391,900</u>	<u>1,487,386</u>	<u>1,762,742</u>	<u>1,614,541</u>
Policy Inforce	<u>77</u>	<u>90</u>	<u>90</u>	<u>108</u>	<u>126</u>
Rate Changes	<u>n/a</u>	<u>n/a</u>	<u>5.6%</u>	<u>n/a</u>	<u>8.4%</u>

Countrywide

	20 <u>14</u>	20 <u>15</u>	20 <u>16</u>	20 <u>17</u>	20 <u>18</u>
Written Premium	<u>135,790,321</u>	<u>127,073,512</u>	<u>113,408,767</u>	<u>103,494,301</u>	<u>93,087,439</u>
Policy Inforce	<u>9,954</u>	<u>8,454</u>	<u>7,400</u>	<u>6,519</u>	<u>5,617</u>
Rate Changes	<u>2.9%</u>	<u>0.6%</u>	<u>3.1%</u>	<u>1.1%</u>	<u>11.9%</u>

District of Columbia Commercial Automobile - Non-Avenues

Rate Level Indication Liability Coverages

Evaluation Date		7/31/2019						
State		DC						
			Acc. Year 2014	Acc. Year 2015	Acc. Year 2016	Acc. Year 2017	Acc. Year 2018	5 Year Total
(1) Collected Earned Premiums			\$786,154	\$871,542	\$946,872	\$1,019,866	\$1,192,159	\$4,816,593
(2) On-Level Factor			1.103	1.103	1.103	1.103	1.069	
(3) Premium at Current Rate Level	(1) * (2)		\$867,128	\$961,311	\$1,044,400	\$1,124,912	\$1,274,418	\$5,272,169
(4) Premium Trend			0.000	0.000	0.000	0.000	0.000	
(5) Trend Period ¹			6.592	5.592	4.592	3.592	2.592	
(6) Trend Factor	[1 + (4)] ^ (5)		1.000	1.000	1.000	1.000	1.000	
(7) Trended On-Level Premium	(3) * (6)		\$867,128	\$961,311	\$1,044,400	\$1,124,912	\$1,274,418	\$5,272,169
(8) Limited Incurred Losses (ex Cats)			\$130,639	\$421,334	\$135,311	\$85,851	\$192,052	\$965,187
(9) Loss Development Factor			1.010	1.026	1.071	1.193	1.616	
(10) Limited Ultimate Losses (ex Cats)	(8) * (9)		\$131,945	\$432,289	\$144,918	\$102,420	\$310,356	\$1,121,928
(11) Loss Trend			0.041	0.041	0.041	0.041	0.041	
(12) Trend Period ¹			6.592	5.592	4.592	3.592	2.592	
(13) Trend Factor	[1 + (11)] ^ (12)		1.303	1.252	1.203	1.155	1.110	
(14) Trended Limited Ultimate Incurred Losses	(13) * (14)		\$171,924	\$541,226	\$174,336	\$118,295	\$344,495	\$1,350,276
(15) LAE Load (% of Premium)			0.112	0.112	0.112	0.112	0.112	
(16) Excess Loss Factor (% of Premium)			0.036	0.036	0.036	0.036	0.036	
(17) Excess Wind & Water Load (% of Loss)			0.000	0.000	0.000	0.000	0.000	
(18) Adjusted Incurred Losses & LAE	{[(7)*(15)]+[(7)*(16)]+(14)]+[(14)*(17)]		\$300,259	\$683,500	\$328,907	\$284,782	\$533,109	\$2,130,557
(19) Adj. Incurred Loss & LAE Ratio	(18) / (7)		34.6%	71.1%	31.5%	25.3%	41.8%	
(20) Accident Year Weights			10.0%	15.0%	20.0%	25.0%	30.0%	100.0%
(21) Weighted Inc. Loss & LAE Ratio								39.3%
(22) Fixed Expenses:								10.2%
(23) Variable Expenses & Profit & Contingency:								31.3%
(24) State Credibility ²								19.4%
(25) CW Weighted Inc. Loss & LAE Ratio								69.3%
(26) Cred. Wtd. Inc. Loss & LAE Ratio	[(24) * (21)] + {[1-(24)] * (25)}							63.5%
(27) Rate Level indication	[(26)+(22)] / [1-(23)] - 1							7.3%

¹ Assumed New Business Effective Date:

2/1/2020

² Credibility based on formula: P/P+K, where P = 5 year earned premium and K =

\$20,000,000

District of Columbia Commercial Automobile - Non-Avenues

Rate Level Indication
No-Fault Coverages

Evaluation Date 7/31/2019							5 Year Total
State DC		Acc. Year 2014	Acc. Year 2015	Acc. Year 2016	Acc. Year 2017	Acc. Year 2018	
(1) Collected Earned Premiums		\$15,373	\$19,233	\$22,604	\$27,266	\$30,326	\$114,802
(2) On-Level Factor		1.115	1.115	1.115	1.115	1.091	
(3) Premium at Current Rate Level	(1) * (2)	\$17,141	\$21,445	\$25,203	\$30,402	\$33,086	\$127,277
(4) Premium Trend		0.000	0.000	0.000	0.000	0.000	
(5) Trend Period ¹		6.592	5.592	4.592	3.592	2.592	
(6) Trend Factor	[1 + (4)] ^ (5)	1.000	1.000	1.000	1.000	1.000	
(7) Trended On-Level Premium	(3) * (6)	\$17,141	\$21,445	\$25,203	\$30,402	\$33,086	\$127,277
(8) Limited Incurred Losses (ex Cats)		\$7,085	\$0	\$0	\$4,391	\$2,675	\$14,151
(9) Loss Development Factor		0.993	0.984	0.990	1.013	1.072	
(10) Limited Ultimate Losses (ex Cats)	(8) * (9)	\$7,035	\$0	\$0	\$4,448	\$2,868	\$14,351
(11) Loss Trend		0.000	0.000	0.000	0.000	0.000	
(12) Trend Period ¹		6.592	5.592	4.592	3.592	2.592	
(13) Trend Factor	[1 + (11)] ^ (12)	1.000	1.000	1.000	1.000	1.000	
(14) Trended Limited Ultimate Incurred Losses	(13) * (14)	\$7,035	\$0	\$0	\$4,448	\$2,868	\$14,351
(15) LAE Load (% of Premium)		0.112	0.112	0.112	0.112	0.112	
(16) Excess Loss Factor (% of Premium)		0.000	0.000	0.000	0.000	0.000	
(17) Excess Wind & Water Load (% of Loss)		0.000	0.000	0.000	0.000	0.000	
(18) Adjusted Incurred Losses & LAE	{[(7)*(15)]+[(7)*(16)]+(14)}+[(14)*(17)]	\$8,955	\$2,402	\$2,823	\$7,853	\$6,574	\$28,607
(19) Adj. Incurred Loss & LAE Ratio	(18) / (7)	52.2%	11.2%	11.2%	25.8%	19.9%	
(20) Accident Year Weights		10.0%	15.0%	20.0%	25.0%	30.0%	100.0%
(21) Weighted Inc. Loss & LAE Ratio							21.6%
(22) Fixed Expenses:							10.2%
(23) Variable Expenses & Profit & Contingency:							31.3%
(24) State Credibility ²							0.6%
(25) CW Weighted Inc. Loss & LAE Ratio							75.7%
(26) Cred. Wtd. Inc. Loss & LAE Ratio	[(24) * (21)] + {[1-(24)] * (25)}						58.8%
(27) Rate Level indication	[(26)+(22)] / [1-(23)] - 1						0.4%

¹ Assumed New Business Effective Date: 2/1/2020

² Credibility based on formula: P/P+K, where P = 5 year earned premium and K = \$20,000,000

District of Columbia Commercial Automobile - Non-Avenues

Rate Level Indication Physical Damage Coverages

Evaluation Date		7/31/2019						
State		DC						
			Acc. Year 2014	Acc. Year 2015	Acc. Year 2016	Acc. Year 2017	Acc. Year 2018	5 Year Total
(1) Collected Earned Premiums			\$406,758	\$448,872	\$470,708	\$531,713	\$660,239	\$2,518,290
(2) On-Level Factor			1.272	1.272	1.272	1.272	1.217	
(3) Premium at Current Rate Level	(1) * (2)		\$517,396	\$570,965	\$598,741	\$676,339	\$803,511	\$3,166,952
(4) Premium Trend			0.013	0.013	0.013	0.013	0.013	
(5) Trend Period ¹			6.592	5.592	4.592	3.592	2.592	
(6) Trend Factor	[1 + (4)] ^ (5)		1.089	1.075	1.061	1.047	1.034	
(7) Trended On-Level Premium	(3) * (6)		\$563,444	\$613,787	\$635,264	\$708,127	\$830,830	\$3,351,452
(8) Limited Incurred Losses (ex Cats)			\$190,044	\$188,793	\$206,169	\$223,392	\$344,446	\$1,152,844
(9) Loss Development Factor			1.000	1.000	0.998	0.995	0.993	
(10) Limited Ultimate Losses (ex Cats)	(8) * (9)		\$190,044	\$188,793	\$205,757	\$222,275	\$342,035	\$1,148,904
(11) Loss Trend			0.052	0.052	0.052	0.052	0.052	
(12) Trend Period ¹			6.592	5.592	4.592	3.592	2.592	
(13) Trend Factor	[1 + (11)] ^ (12)		1.397	1.328	1.262	1.200	1.140	
(14) Trended Limited Ultimate Incurred Losses	(13) * (14)		\$265,491	\$250,717	\$259,665	\$266,730	\$389,920	\$1,432,523
(15) LAE Load (% of Premium)			0.111	0.111	0.111	0.111	0.111	
(16) Excess Loss Factor (% of Premium)			0.000	0.000	0.000	0.000	0.000	
(17) Excess Wind & Water Load (% of Loss)			0.008	0.008	0.008	0.008	0.008	
(18) Adjusted Incurred Losses & LAE	{[(7)*(15)]+[(7)*(16)]+(14)}+[(14)*(17)]		\$330,157	\$320,853	\$332,257	\$347,466	\$485,261	\$1,815,994
(19) Adj. Incurred Loss & LAE Ratio	(18) / (7)		58.6%	52.3%	52.3%	49.1%	58.4%	
(20) Accident Year Weights			10.0%	15.0%	20.0%	25.0%	30.0%	100.0%
(21) Weighted Inc. Loss & LAE Ratio								54.0%
(22) Fixed Expenses:								10.7%
(23) Variable Expenses & Profit & Contingency:								32.8%
(24) State Credibility ²								55.7%
(25) CW Weighted Inc. Loss & LAE Ratio								55.7%
(26) Cred. Wtd. Inc. Loss & LAE Ratio	[(24) * (21)] + {[1-(24)] * (25)}							54.8%
(27) Rate Level indication	[(26)+(22)] / [1-(23)] - 1							-2.5%

¹ Assumed New Business Effective Date: 2/1/2020

² Credibility based on formula: P/P+K, where P = 5 year earned premium and K = \$2,000,000

District of Columbia		
Non-Avenues Commercial Auto Combined Indication		
Proposed Effective Date: 3/1/2020		
	Indication	Weight
Liability	7.3%	61.5%
No-Fault (P.I.P.)	0.4%	1.5%
Physical Damage	-2.5%	37.0%
Combined	3.6%	

Expected Loss Ratio

Commercial Automobile - Liability and No-Fault

Expense Category	Total Expense	Fixed Expense	Variable Expense	Source
(1) Commission and Brokerage	20.5%	0.0%	20.5%	District of Columbia-specific expense from Page 14
(2) General Expense	11.0%	8.3%	2.8%	Countrywide IEE for Commercial Auto
(3) Other Acquisition	5.8%	1.9%	3.9%	Countrywide IEE for Commercial Auto
(4) Taxes, Licenses, and Fees	2.3%	0.0%	2.3%	District of Columbia-specific expense from Page 14
(5) Profit & Contingencies	1.8%	0.0%	1.8%	District of Columbia IRR Model for Comm Auto Liability
(6) Total Expenses & Profit	41.4%	10.2%	31.3%	(1) + (2) + (3) + (4) + (5)
(7) Permissible Loss & LAE Ratio	58.6%			1- (6)

Expected Loss Ratio

Commercial Automobile - Physical Damage

Expense Category	Total Expense	Fixed Expense	Variable Expense	Source
(1) Commission and Brokerage	21.1%	0.0%	21.1%	District of Columbia-specific expense from Page 14
(2) General Expense	11.7%	8.8%	2.9%	Countrywide IEE for Commercial Auto
(3) Other Acquisition	5.7%	1.9%	3.8%	Countrywide IEE for Commercial Auto
(4) Taxes, Licenses, and Fees	2.3%	0.0%	2.3%	District of Columbia-specific expense from Page 14
(5) Profit & Contingencies	2.7%	0.0%	2.7%	District of Columbia IRR Model for Comm Auto Physical Damage
(6) Total Expenses & Profit	43.5%	10.7%	32.8%	(1) + (2) + (3) + (4) + (5)
(7) Permissible Loss & LAE Ratio	56.5%			1- (6)

Includes data for all companies in the state

District of Columbia Commercial Automobile

Rate Level Indication

Trend values from ISO Loss Cost Filing Designation **CA-2019-BRLA1**

Commercial Auto Liability and No-Fault Loss Trend

District of Columbia Trend	ISO	weight*	weighted trend	
\$100k CSL Bodily Injury	-1.40%			
Property Damage	7.10%			
Credibility-Weighted DC Trend				
\$100k CSL Bodily Injury	3.80%	72.8%	2.8%	(1)
Property Damage	4.90%	27.2%	1.3%	(2)
No-Fault (P.I.P.) Trend				
Trucks, Tractors, and Trailers	0.00%	62.9%	0.0%	(3)
Private Passenger Types	0.00%	36.9%	0.0%	(4)
Garages	0.00%	0.3%	0.0%	(5)
			4.1%	Selected Liability Loss Trend [(1) + (2)]
			0.0%	Selected P.I.P. Loss Trend [(3) + (4) + (5)]

Commercial Auto Physical Damage Loss Trend

Trucks, Tractors, and Trailers	ISO	weight*	TTT / PPT weight*	weighted trend	
(OTC) Comprehensive	7.00%	25.7%		1.1%	(6)
Collision	5.00%	74.3%	63.2%	2.3%	(7)
Private Passenger Types and Garages					
(OTC) Comprehensive	6.50%	25.7%	36.8%	0.6%	(8)
Collision	4.50%	74.3%		1.2%	(9)
				5.2%	Selected Loss Trend [(6) + (7) + (8) + (9)]

Commercial Auto Physical Damage Premium (OCN) Trend

Trucks, Tractors, and Trailers	ISO	weight*	TTT / PPT weight*	weighted trend	
(OTC) Comprehensive	1.00%	25.7%	63.2%	0.2%	(10)
Collision	1.60%	74.3%		0.8%	(11)
Private Passenger Types and Garages					
(OTC) Comprehensive	1.10%	25.7%	36.8%	0.1%	(12)
Collision	0.60%	74.3%		0.2%	(13)
				1.3%	Selected Premium (OCN) Trend [(10) + (11) + (12) + (13)]

* Weights are based upon AY 2015 - 2017 Hanover Insurance Group Countrywide Incurred Loss distributions

Rate Level Indication

Limited to \$250,000

AY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192
2004	9,719	14,289	16,253	17,095	17,513	17,674	17,658	17,854	17,854	17,854	17,854	17,854	17,854	17,854	17,854	-
2005	11,210	16,944	18,779	20,633	20,787	20,426	20,431	20,433	20,420	20,452	20,451	20,451	20,451	20,486	-	-
2006	10,747	15,284	17,371	19,623	19,674	19,845	19,896	19,866	19,881	19,881	19,881	19,881	19,881	19,846	-	-
2007	10,922	15,824	18,722	19,743	20,238	20,171	20,205	20,125	20,125	20,125	20,125	20,123	-	-	-	-
2008	10,028	17,590	20,253	21,484	22,716	22,710	22,726	22,821	22,822	22,857	22,857	-	-	-	-	-
2009	12,151	19,174	21,063	22,618	23,869	24,240	24,244	24,116	24,235	24,235	-	-	-	-	-	-
2010	14,217	22,163	27,829	29,515	30,418	30,607	30,726	30,780	30,858	-	-	-	-	-	-	-
2011	12,263	23,507	27,018	29,770	30,426	30,618	30,588	30,599	-	-	-	-	-	-	-	-
2012	17,353	28,642	33,207	35,769	37,346	37,849	38,093	-	-	-	-	-	-	-	-	-
2013	15,208	28,200	32,948	36,862	37,213	37,676	-	-	-	-	-	-	-	-	-	-
2014	13,292	25,036	30,291	31,906	32,401	-	-	-	-	-	-	-	-	-	-	-
2015	15,107	27,388	30,232	31,798	-	-	-	-	-	-	-	-	-	-	-	-
2016	12,543	19,769	24,374	-	-	-	-	-	-	-	-	-	-	-	-	-
2017	9,571	18,885	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2018	9,510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Development Factors																
Period	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - Ult
2004	1.470	1.137	1.052	1.024	1.009	0.999	1.011	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
2005	1.511	1.108	1.099	1.007	0.983	1.000	1.000	0.999	1.002	1.000	1.000	1.000	1.002			
2006	1.422	1.137	1.130	1.003	1.009	1.003	0.999	1.001	1.000	1.000	1.000	0.998				
2007	1.449	1.183	1.055	1.025	0.997	1.002	0.996	1.000	1.000	1.000	1.000					
2008	1.754	1.151	1.061	1.057	1.000	1.001	1.004	1.000	1.002	1.000						
2009	1.578	1.099	1.074	1.055	1.016	1.000	0.995	1.005	1.000							
2010	1.559	1.256	1.061	1.031	1.006	1.004	1.002	1.003								
2011	1.917	1.149	1.102	1.022	1.006	0.999	1.000									
2012	1.651	1.159	1.077	1.044	1.013	1.006										
2013	1.854	1.168		1.119	1.012											
2014	1.884	1.210	1.053	1.016												
2015	1.813	1.104	1.052													
2016	1.576	1.233														
2017	1.973															
2018																
Development Averages																
5 Yr X H/L	1.850	1.179	1.077	1.023	1.010	1.002	0.999	1.001	1.001	1.000	1.000					
3 Yr Avg	1.787	1.182	1.075	1.023	1.010	1.003	0.999	1.003	1.001	1.000	1.000	1.000	1.000			
Selected	1.787	1.182	1.075	1.023	1.010	1.003	0.999	1.003	1.001	1.000	1.000	1.000	1.000	1.000	1.000	
Yr X H/L cum	2.435	1.316	1.116	1.036	1.013	1.003	1.001	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3 Yr cum.	2.359	1.320	1.117	1.039	1.016	1.006	1.003	1.004	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Selected	2.359	1.320	1.117	1.039	1.016	1.006	1.003	1.004	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000

District of Columbia Commercial Automobile
Rate Level Indication
Loss Development - Liability
 Direct Incurred Losses (\$000)

Unlimited	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192
AY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192
2004	13,839	19,242	22,300	24,091	24,282	24,493	24,432	24,653	24,653	24,828	24,828	24,828	24,828	24,828	24,828	-
2005	16,293	23,680	25,842	28,290	28,398	28,134	28,140	28,217	28,204	28,236	28,235	28,235	28,235	28,270	-	-
2006	14,607	20,762	24,107	26,857	27,816	28,029	28,080	28,050	28,124	28,124	28,124	28,124	28,124	28,089	-	-
2007	13,734	20,443	25,014	27,411	28,812	28,819	28,878	28,748	28,748	28,747	28,746	28,746	-	-	-	-
2008	11,765	20,692	24,909	27,053	28,880	28,985	29,001	29,096	29,097	29,132	29,234	-	-	-	-	-
2009	13,908	22,453	26,070	29,901	32,839	33,711	33,683	33,655	35,160	35,160	-	-	-	-	-	-
2010	16,766	28,564	36,780	41,966	44,210	44,525	44,712	44,899	44,979	-	-	-	-	-	-	-
2011	13,613	28,776	34,992	40,932	43,088	44,036	44,006	44,183	-	-	-	-	-	-	-	-
2012	23,133	36,477	43,898	49,289	52,340	53,429	54,072	-	-	-	-	-	-	-	-	-
2013	21,234	40,515	48,384	56,093	58,323	60,572	-	-	-	-	-	-	-	-	-	-
2014	16,054	32,451	40,608	45,017	47,039	-	-	-	-	-	-	-	-	-	-	-
2015	16,847	32,583	39,230	43,815	-	-	-	-	-	-	-	-	-	-	-	-
2016	13,765	23,906	32,523	-	-	-	-	-	-	-	-	-	-	-	-	-
2017	11,226	26,486	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2018	10,510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Development Factors																
Period	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - Ult
2004	1.390	1.159	1.080	1.008	1.009	0.998	1.009	1.000	1.007	1.000	1.000	1.000	1.000	1.000	1.000	-
2005	1.453	1.091	1.095	1.004	0.991	1.000	1.003	1.000	1.001	1.000	1.000	1.000	1.001	-	-	-
2006	1.421	1.161	1.114	1.036	1.008	1.002	0.999	1.003	1.000	1.000	1.000	0.999	-	-	-	-
2007	1.489	1.224	1.096	1.051	1.000	1.002	0.995	1.000	1.000	1.000	1.000	-	-	-	-	-
2008	1.759	1.204	1.086	1.068	1.004	1.001	1.003	1.000	1.001	1.004	-	-	-	-	-	-
2009	1.614	1.161	1.147	1.098	1.027	0.999	0.999	1.045	1.000	-	-	-	-	-	-	-
2010	1.704	1.288	1.141	1.053	1.007	1.004	1.004	1.002	-	-	-	-	-	-	-	-
2011	2.114	1.216	1.170	1.053	1.022	0.999	1.004	-	-	-	-	-	-	-	-	-
2012	1.577	1.203	1.123	1.062	1.021	1.012	-	-	-	-	-	-	-	-	-	-
2013	1.908	1.194	1.159	1.040	1.039	-	-	-	-	-	-	-	-	-	-	-
2014	2.021	1.251	1.109	1.045	-	-	-	-	-	-	-	-	-	-	-	-
2015	1.934	1.204	1.117	-	-	-	-	-	-	-	-	-	-	-	-	-
2016	1.737	1.360	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2017	2.359	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Development Averages																
5 Yr X H/L	1.954	1.219	1.133	1.050	1.023	1.001	1.002	1.002	1.000	1.000	1.000	-	-	-	-	-
3 Yr Avg	2.010	1.272	1.128	1.049	1.027	1.005	1.002	1.016	1.000	1.001	1.000	1.000	1.000	1.000	1.000	1.000
Selected	2.010	1.272	1.128	1.049	1.027	1.005	1.002	1.016	1.000	1.001	1.000	1.000	1.000	1.000	1.000	1.000
Yr X H/L cun	2.913	1.491	1.223	1.079	1.028	1.005	1.004	1.002	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3 Yr cum.	3.184	1.584	1.245	1.104	1.052	1.024	1.019	1.017	1.001	1.001	1.000	1.000	1.000	1.000	1.000	1.000
Selected	3.184	1.584	1.245	1.104	1.052	1.024	1.019	1.017	1.001	1.001	1.000	1.000	1.000	1.000	1.000	1.000

Rate Level Indication

Direct Incurred Losses (\$000)

[illegible][illegible][illegible]

Rate Level Indication

Unlimited

[illegible][illegible]

Rate Level Indication

Limited to \$250,000

Limited to \$250,000																	
AY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	
2004	20,006	21,106	21,063	21,032	21,028	21,018	21,024	21,021	21,018	21,015	21,014	21,011	21,011	21,011	21,011	-	
2005	20,993	22,217	22,188	22,193	22,178	22,172	22,164	22,166	22,161	22,160	22,160	22,160	22,160	22,160	-	-	
2006	20,531	21,088	20,929	20,931	20,909	20,897	20,894	20,893	20,892	20,890	20,888	20,888	20,886	-	-	-	
2007	23,264	23,883	23,589	23,580	23,565	23,569	23,567	23,568	23,567	23,567	23,566	23,565	-	-	-	-	
2008	24,369	25,846	25,684	25,661	25,648	25,646	25,646	25,649	25,648	25,648	25,648	-	-	-	-	-	
2009	22,339	22,860	22,731	22,684	22,685	22,672	22,671	22,666	22,666	22,666	-	-	-	-	-	-	
2010	24,367	25,219	25,065	25,022	24,988	24,980	24,979	24,979	24,979	-	-	-	-	-	-	-	
2011	33,341	33,901	33,758	33,718	33,729	33,723	33,721	33,721	-	-	-	-	-	-	-	-	
2012	35,686	36,670	36,429	36,360	36,318	36,306	36,306	-	-	-	-	-	-	-	-	-	
2013	40,122	41,770	41,601	41,560	41,547	41,554	-	-	-	-	-	-	-	-	-	-	
2014	44,791	44,595	44,254	44,159	44,128	-	-	-	-	-	-	-	-	-	-	-	
2015	43,920	43,731	43,447	43,370	-	-	-	-	-	-	-	-	-	-	-	-	
2016	42,847	43,115	42,879	-	-	-	-	-	-	-	-	-	-	-	-	-	
2017	44,771	45,415	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2018	47,601	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Development Factors																	
Period	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - Ult	
2004	1.055	0.998	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2005	1.058	0.999	1.000	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2006	1.027	0.992	1.000	0.999	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2007	1.027	0.988	1.000	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2008	1.061	0.994	0.999	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2009	1.023	0.994	0.998	1.000	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2010	1.035	0.994	0.998	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2011	1.017	0.996	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2012	1.028	0.993	0.998	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2013	1.041	0.996	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2014	0.996	0.992	0.998	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2015	0.996	0.994	0.998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2016	1.006	0.995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2017	1.014	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2018	1.014	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Development Averages																	
5 Yr X H/L	1.005	0.994	0.998	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
3 Yr Avg	1.005	0.994	0.998	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Selected	1.005	0.994	0.998	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Yr X H/L cum	0.996	0.991	0.997	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
3 Yr cum.	0.996	0.991	0.997	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Selected	0.996	0.991	0.997	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	

Rate Level Indication

Direct Incurred Losses (\$000)

[illegible][illegible][illegible]

District of Columbia Commercial Automobile

Rate Level Indication

**Liability Excess Loss Load
based on District of Columbia Data**

(1) Calendar/ Accident Year	(2) Direct Earned Premium	(3) Unlimited Incurred Losses	(4) Limited Incurred Losses	(5) Liability Unlimited LDF	(6) Liability Limited LDF	(7) Ultimate Unlimited Losses	(8) Ultimate Limited Losses	(9) Ultimate Losses XS of \$250k	(10) Ultimate Excess Loss Load
2014	\$1,071,035	\$167,734	\$167,734	1.035	1.010	\$173,605	\$169,411	\$4,194	0.4%
2015	\$1,203,039	\$525,097	\$469,774	1.073	1.026	\$563,429	\$481,988	\$81,441	6.8%
2016	\$1,351,947	\$239,187	\$239,187	1.159	1.071	\$277,218	\$256,169	\$21,049	1.6%
2017	\$1,458,132	\$188,114	\$188,114	1.367	1.193	\$257,152	\$224,420	\$32,732	2.2%
2018	\$1,635,998	\$276,616	\$276,616	2.004	1.616	\$554,338	\$447,011	\$107,327	6.6%

3 Year Average

3.6%

5 Year Average

3.7%

Selected Excess Ratio (% of Premium)

3.6%

**No-Fault Excess Loss Load
based on District of Columbia Data**

(1) Calendar/ Accident Year	(2) Direct Earned Premium	(3) Unlimited Incurred Losses	(4) Limited Incurred Losses	(5) No-Fault Unlimited LDF	(6) No-Fault Limited LDF	(7) Ultimate Unlimited Losses	(8) Ultimate Limited Losses	(9) Ultimate Losses XS of \$250k	(10) Ultimate Excess Loss Load
2014	\$19,100	\$10,045	\$10,045	0.993	0.993	\$9,974	\$9,974	\$0	0.0%
2015	\$23,763	\$12,701	\$12,701	0.984	0.984	\$12,498	\$12,498	\$0	0.0%
2016	\$28,152	\$1,871	\$1,871	0.990	0.990	\$1,852	\$1,852	\$0	0.0%
2017	\$33,408	\$5,929	\$5,929	1.013	1.013	\$6,006	\$6,006	\$0	0.0%
2018	\$35,634	\$2,675	\$2,675	1.063	1.072	\$2,844	\$2,868	-\$24	-0.1%

3 Year Average

0.0%

5 Year Average

0.0%

Selected Excess Ratio (% of Premium)

0.0%

**Physical Damage Excess Loss Load
based on District of Columbia Data**

(1) Calendar/ Accident Year	(2) Direct Earned Premium	(3) Unlimited Incurred Losses	(4) Limited Incurred Losses	(5) Phys Dam Unlimited LDF	(6) Phys Dam Limited LDF	(7) Ultimate Unlimited Losses	(8) Ultimate Limited Losses	(9) Ultimate Losses XS of \$250k	(10) Ultimate Excess Loss Load
2014	\$449,212	\$201,333	\$201,333	1.000	1.000	\$201,333	\$201,333	\$0	0.0%
2015	\$507,978	\$224,641	\$224,641	1.000	1.000	\$224,641	\$224,641	\$0	0.0%
2016	\$563,518	\$260,216	\$260,216	0.998	0.998	\$259,695	\$259,695	\$0	0.0%
2017	\$633,064	\$331,746	\$331,746	0.995	0.995	\$330,087	\$330,087	\$0	0.0%
2018	\$749,100	\$393,668	\$393,668	0.993	0.993	\$390,913	\$390,913	\$0	0.0%

3 Year Average

0.0%

5 Year Average

0.0%

Selected Excess Ratio (% of Premium)

0.0%

(2) to (4): Based on both Avenues and Non-Avenues loss data in the state

(5) and (6): Based on state's historical loss triangles for Avenues and Non-Avenues

(7) = (3) x (5)

(8) = (4) x (6)

(9) = (7) - (8)

(10) = (9) / (2)

**Liability Excess Loss Ratio
based on Countrywide Data**

(1) Calendar/ Accident Year	(2) Direct Earned Premium	(3) Unlimited Reported Losses	(4) Limited Reported Losses	(5) Liability Unlimited LDF	(6) Liability Limited LDF	(7) Ultimate Unlimited Losses	(8) Ultimate Limited Losses	(9) Ultimate Losses XS of \$250k	(10) Ultimate Excess Loss Ratio
2014	\$216,913,904	\$129,706,827	\$95,304,751	1.024	1.009	\$132,819,790	\$96,162,493	\$36,657,297	16.9%
2015	\$216,052,754	\$124,437,580	\$96,588,695	1.050	1.019	\$130,659,459	\$98,423,880	\$32,235,579	14.9%
2016	\$215,819,066	\$129,409,090	\$97,461,546	1.116	1.053	\$144,420,544	\$102,627,008	\$41,793,536	19.4%
2017	\$219,797,692	\$119,194,799	\$91,431,619	1.280	1.158	\$152,569,343	\$105,877,815	\$46,691,528	21.2%
2018	\$232,039,121	\$79,266,515	\$69,651,272	1.749	1.492	\$138,637,134	\$103,919,697	\$34,717,437	15.0%

3 Year Average	18.5%
5 Year Average	17.5%
Selected Excess Ratio (% of Premium)	17.5%

**Physical Damage Excess Loss Ratio
based on Countrywide Data**

(1) Calendar/ Accident Year	(2) Direct Earned Premium	(3) Unlimited Reported Losses	(4) Limited Reported Losses	(5) Phys Dam Unlimited LDF	(6) Phys Dam Limited LDF	(7) Ultimate Unlimited Losses	(8) Ultimate Limited Losses	(9) Ultimate Losses XS of \$250k	(10) Ultimate Excess Loss Ratio
2014	\$70,657,831	\$44,126,938	\$44,126,938	1.000	1.000	\$44,126,938	\$44,126,938	\$0	0.0%
2015	\$72,424,993	\$43,370,594	\$43,370,594	1.000	1.000	\$43,370,594	\$43,370,594	\$0	0.0%
2016	\$73,422,166	\$42,805,064	\$42,805,064	0.998	0.998	\$42,719,454	\$42,719,454	\$0	0.0%
2017	\$77,401,302	\$45,195,173	\$45,195,173	0.995	0.995	\$44,969,197	\$44,969,197	\$0	0.0%
2018	\$83,956,715	\$48,921,887	\$48,921,887	0.993	0.993	\$48,579,434	\$48,579,434	\$0	0.0%

3 Year Average	0.0%
5 Year Average	0.0%
Selected Excess Ratio (% of Premium)	0.0%

**No-Fault Excess Loss Ratio
based on Countrywide excluding Michigan Data**

(1) Calendar/ Accident Year	(2) Direct Earned Premium	(3) Unlimited Reported Losses	(4) Limited Reported Losses	(5) No-Fault Unlimited LDF	(6) No-Fault Limited LDF	(7) Ultimate Unlimited Losses	(8) Ultimate Limited Losses	(9) Ultimate Losses XS of \$100k	(10) Ultimate Excess Loss Ratio
2014	\$205,804,641	\$122,280,946	\$90,289,926	0.993	0.993	\$121,424,979	\$89,657,896	\$31,767,083	15.4%
2015	\$206,523,503	\$116,993,778	\$92,492,994	0.984	0.984	\$115,121,878	\$91,013,106	\$24,108,772	11.7%
2016	\$207,501,140	\$125,635,928	\$94,533,385	0.990	0.990	\$124,379,569	\$93,588,051	\$30,791,518	14.8%
2017	\$212,428,402	\$113,830,663	\$88,669,734	1.013	1.013	\$115,310,462	\$89,822,441	\$25,488,021	12.0%
2018	\$224,577,181	\$77,908,322	\$68,418,079	1.063	1.072	\$82,816,546	\$73,344,181	\$9,472,365	4.2%

3 Year Average	10.2%
5 Year Average	11.5%
Selected Excess Ratio (% of Premium)	11.5%

(2) to (4): Based on an internal Hanover Insurance Group data query for Commercial Auto, based upon policy line of business.

(5) and (6): Based on countrywide historical loss triangles. For No-Fault, based on countrywide excluding Michigan historical loss triangles.

(7) = (3) x (5)

(8) = (4) x (6)

(9) = (7) - (8)

(10) = (9) / (2)

Commercial Automobile

Rate Level Indication

ISO Excess Wind & Water Commercial Automobile - Comprehensive (OTC) ISO Loss Cost Filing Designation: CA-2019-BRLA1 All Vehicle Types Combined

Accident Year	(1) OTC Wind & Water Losses	(2) OTC Total Losses	(3) = (2) - (1) Total Non Wind/Water Losses	(4) = (1) / (3) Ratio Wind/Water	(5) Capped Wind/Water Ratio (< 5*Median)	(6) = (5) - Avg(5) Capped Excess Wind/Water Ratio	(7) = (4) - (5) Excess Wind/Water Ratio Above Cap	(8) = [(6)+(7)]*(3) Total Excess Wind/Water Losses
1988	\$1,349	\$213,112	\$211,763	0.006	0.006	0.000	0.000	\$0
1989	\$18,315	\$470,287	\$451,972	0.041	0.041	0.000	0.000	\$0
1990	\$18,807	\$369,442	\$350,635	0.054	0.054	0.000	0.000	\$0
1991	\$723	\$304,774	\$304,051	0.002	0.002	0.000	0.000	\$0
1992	\$17,142	\$207,396	\$190,254	0.090	0.090	0.004	0.000	\$761
1993	\$14,056	\$225,267	\$211,211	0.067	0.067	0.000	0.000	\$0
1994	\$13,576	\$307,321	\$293,745	0.046	0.046	0.000	0.000	\$0
1995	\$8,543	\$187,526	\$178,983	0.048	0.048	0.000	0.000	\$0
1996	\$2,915	\$425,281	\$422,366	0.007	0.007	0.000	0.000	\$0
1997	\$4,851	\$246,577	\$241,726	0.020	0.020	0.000	0.000	\$0
1998	\$0	\$224,765	\$224,765	0.000	0.000	0.000	0.000	\$0
1999	\$5,484	\$120,605	\$115,121	0.048	0.048	0.000	0.000	\$0
2000	\$18,672	\$347,873	\$329,201	0.057	0.057	0.000	0.000	\$0
2001	\$2,753	\$213,367	\$210,614	0.013	0.013	0.000	0.000	\$0
2002	\$31,470	\$248,181	\$216,711	0.145	0.145	0.059	0.000	\$12,786
2003	\$5,051	\$294,248	\$289,197	0.017	0.017	0.000	0.000	\$0
2004	\$115,956	\$266,062	\$150,106	0.772	0.295	0.209	0.477	\$102,973
2005	\$11,306	\$171,161	\$159,855	0.071	0.071	0.000	0.000	\$0
2006	\$6,867	\$87,121	\$80,254	0.086	0.086	0.000	0.000	\$0
2007	\$25,782	\$91,895	\$66,113	0.390	0.295	0.209	0.095	\$20,098
2008	\$964	\$83,722	\$82,758	0.012	0.012	0.000	0.000	\$0
2009	\$22,712	\$145,006	\$122,294	0.186	0.186	0.100	0.000	\$12,229
2010	\$12,906	\$116,216	\$103,310	0.125	0.125	0.039	0.000	\$4,029
2011	\$21,401	\$233,376	\$211,975	0.101	0.101	0.015	0.000	\$3,180
2012	\$35,061	\$158,730	\$123,669	0.284	0.284	0.198	0.000	\$24,486
2013	\$14,520	\$103,401	\$88,881	0.163	0.163	0.077	0.000	\$6,844
2014	\$0	\$74,621	\$74,621	0.000	0.000	0.000	0.000	\$0
2015	\$6,300	\$109,419	\$103,119	0.061	0.061	0.000	0.000	\$0
2016	\$15,783	\$254,495	\$238,712	0.066	0.066	0.000	0.000	\$0
2017	\$23,660	\$159,078	\$135,418	0.175	0.175	0.089	0.000	\$12,052

	Averages	0.086	0.033	0.019
Median		0.059		
Median * 5		0.295		

(9) Excess Wind & Water Factor = 1.049
 $1.0 + [(Avg(6) + Avg(7)) / (1.0 + Avg(5) - Avg(6))]$

(10) Normal Wind & Water Factor = 0.043
 $[(Sum(1) - Sum(8))/sum(2)]$

Final Comprehensive (OTC) Factors		
(9) - 1	(10)	avg (5)
Excess Wind/Water	Normal Excess Wind/Water	Capped Wind/Water Ratio
4.9%	4.3%	8.6%

(11) DC Hanover Insurance Group Collision Losses: \$1,168,975
Based on AYs 2015 - 2017

(12) DC Hanover Insurance Group OTC Losses: \$226,671
Based on AYs 2015 - 2017

(13) % Comprehensive (OTC): 16.2%
 $(12)/[(11)+(12)]$

(14) Final Physical Damage Excess Wind/Water Factor: 0.8%
 $[(9) - 1]*(13)$

Reflection of Investment Income in Rates Commercial Auto District of Columbia

The Hanover Insurance Group utilizes an internal rate of return (IRR) model on a net of reinsurance basis to determine the profit provision for our various lines of business. The IRR is the expected rate of return generated from modeling insurance company operations. Hanover targets a 13% after-tax rate of return. This implies that the underwriting and investment income attributable to the insurance transaction yields a 13% return on the shareholders' equity to support the insurance writings. The IRR model produces a target combined ratio on a net basis. The net target combined ratio is then converted to a direct basis with the assumption that the profit is not attributable to the ceded premium because reinsurer's profit is contemplated in the reinsurance margin. The conversion is based on the following formula:

$$\text{Direct Target Combined Ratio} = \frac{(\text{Net Premium @ 13\% Rate of Return} \times \text{Net Target Combined Ratio}) + \text{Ceded Premium}}{\text{Total Direct Premium}}$$

The results are shown in Table 4. Details regarding the expense, loss and surplus assumptions are summarized below.

The IRR model is a single policyholder model, i.e. the profit provision is determined by modeling the cash flows for a hypothetical policyholder. The cash flows in the IRR model can be segregated into three categories: premium, loss and expense.

The expenses assumed in this model are countrywide line-of-business-specific figures, shown in Table 3. The split of the general and other acquisition expenses between fixed and variable is based on a review of our Insurance Expense Exhibit.

To properly model the cash flows, we need to estimate when the premium is collected and expenses are paid. The premium collection pattern is based on a countrywide analysis of the payment plans for the line of business. Premium is earned evenly over the policy term. The expenses are paid as premium is earned.

The loss and DCCE payment pattern is based on a countrywide analysis of our net paid and incurred loss development triangles. The ultimate net loss ratio is based on the prospective estimate obtained from our planning process. The undiscounted loss and DCCE reserve represents the difference between the incurred loss and DCCE and any payments made to date. The published IRS discount factors are utilized to determine the discounted loss reserve used in the income tax calculation.

The required surplus associated with the transaction changes over time and is related to the sum of the unearned premium and loss reserves based on the reserve-to-surplus (R:S) and premium-to-surplus (P:S) ratio assumptions. To obtain the line of business P:S ratios, a companywide total required surplus is allocated to individual lines of business based on the risks associated with each of the lines. These risks include underwriting (both catastrophe and excluding catastrophe), reserving, investment, credit and operational. The total assets are the sum of the unearned premium and loss reserves plus the required surplus. The assets available for investment are the total assets less any premium receivable and expenses paid.

The investment income is that attributable to the average investable assets from the balance sheet in the model. The pre-tax investment yield used in the model is determined based on a combination of yields from existing and newly-invested assets. The underwriting income represents the difference between earned premium and incurred loss and expense. The model assumes expense is incurred based on each expense component's assumed patterns. The change in surplus represents the difference between the ending and beginning required surplus from the balance sheet. The post-tax equity flow is the difference between the pre-tax income and the change in surplus adjusted for the estimated income tax. These equity flows are evaluated to determine the implied internal rate of return.

The Hanover Insurance Group Internal Rate of Return Calculation

Commercial Auto Liability

TABLE 1: Key Target Inputs

Target ROE	13.0%
Premium-to-Surplus	2.16
Reserve-to-Surplus	4.50
Tax Rate	21.0%
Pre-Tax Investment Yield	3.7%
Initial Premium	1,000
Net-to-Direct Ratio	99.6%

TABLE 2: Loss Ratio Inputs

Expected Ex Cat Loss Ratio	60.6%
Expected Cat Ratio	0.0%
DCCE (% loss)	8.4%

TABLE 5: Internal Rate of Return Analysis

Time Period					Premium					Expenses Incl. AOE			Losses + DCCE Including Catastrophes					
Year	Quarter	Mid	NPV Factor @ 13.0%	IRS Discount Factor	Written		Earned			Inc'd	Paid	Resv	Case Incurred		Paid		Loss & DCCE Reserve	
					Collected	Rcvble		Unearned Premium Reserve					%	\$	%	\$	End	Avg
								End	Avg									
0	0	0	1.00	1.00	1,120	13%	973		1,120	220	220		%	\$	%	\$	End	Avg
1	1	1/8	0.98	0.94		26%	686	280	840	58	45	14	25%	164	2%	12	152	76
1	2	3/8	0.96	0.94		26%	398	280	560	58	45	27	25%	164	4%	25	291	222
1	3	5/8	0.93	0.94		26%	112	280	280	58	46	39	25%	164	5%	35	421	356
1	4	7/8	0.90	0.94		10%		280		58	46	51	25%	164	6%	41	544	482
2	1	1 1/8	0.87	0.94		0%					25	27			6%	37	507	526
2	2	1 3/8	0.85	0.94		0%					2	24			5%	31	476	492
2	3	1 5/8	0.82	0.94		0%					2	22			5%	31	445	460
2	4	1 7/8	0.80	0.94		0%					2	20			5%	33	412	428
3	1	2 1/8	0.77	0.95		0%					2	18			5%	33	379	395
3	2	2 3/8	0.75	0.95		0%					2	17			5%	35	344	361
3	3	2 5/8	0.73	0.95		0%					2	15			5%	35	309	327
3	4	2 7/8	0.70	0.95		0%					2	13			5%	34	275	292
4	1	3 1/8	0.68	0.95		0%					2	12			5%	33	242	259
4	2	3 3/8	0.66	0.95		0%					2	10			5%	31	211	227
4	3	3 5/8	0.64	0.95		0%					1	9			4%	29	182	196
4	4	3 7/8	0.62	0.95		0%					1	7			4%	27	155	168
5	4	4 1/2	0.58	0.95		0%					4	4			12%	81	74	115
6	4	5 1/2	0.51	0.95		0%					2	2			7%	43	32	53
7	4	6 1/2	0.45	0.95		0%					1	1			3%	17	15	23
8	4	7 1/2	0.40	0.95		0%					0	0			1%	9	6	10
9	4	8 1/2	0.35	0.96		0%					0	0			1%	4	2	4
10	4	9 1/2	0.31	0.98		0%					0	0			0%	1	1	2
11	4	10 1/2	0.28	0.98		0%					0	0			0%	1	0	1
12	4	11 1/2	0.25	0.98		0%					0	0			0%	0	0	0
13	4	12 1/2	0.22	0.98		0%					0	0			0%	0	0	0
14	4	13 1/2	0.19	0.98		0%					0	0			0%	0	0	0
15	4	14 1/2	0.17	0.98		0%					0	0			0%	0	0	0
16	4	15 1/2	0.15	0.98		0%					0	0			0%	0	0	0
17	4	14 1/2	0.17	0.98		0%					0	0			0%	0	0	0
18	4	17 1/2	0.12	0.98		0%					0	0			0%	0	0	0
19	4	18 1/2	0.10	0.98		0%					0	0			0%	0	0	0
20	4	19 1/2	0.09	0.98		0%					0	0			0%	0	0	0
21	4	20 1/2	0.08	0.98		0%					0	0			0%	0	0	0
22	4	21 1/2	0.07	0.98		0%					0	0			0%	0	0	0
23	4	22 1/2	0.06	0.98		0%					0	0			0%	0	0	0
24	4	23 1/2	0.06	0.98		0%					0	0			0%	0	0	0
25	4	24 1/2	0.05	0.98		0%					0	0			0%	0	0	0
26	4	25 1/2	0.04	0.98		0%					0	0			0%	0	0	0
27	4	26 1/2	0.04	0.98		0%					0	0			0%	0	0	0
28	4	27 1/2	0.03	0.98		0%					0	0			0%	0	0	0
29	4	28 1/2	0.03	0.98		0%					0	0			0%	0	0	0
30	4	29 1/2	0.03	0.98		0%					0	0			0%	0	(0)	0
Total					1,120	100%		1,120		454	454		100%	656	100%	656		

Average Reserve Balance		(421)		700	560		87		1,467	1,525
Average Weighted Life	0.38		0.50		0.46	1.62		2.82		2.01

The Hanover Insurance Group Internal Rate of Return Calculation

Commercial Auto Liability

TABLE 3: Expense / Misc Income Inputs

	% of prem	% fixed
Commissions	14.7%	0%
Contingent Commissions	2.0%	0%
Premium Tax	2.4%	0%
General Expenses	11.2%	50%
Other Acquisitions	5.6%	50%
Dividends	0.0%	0%
Reinsurance	0.0%	100%
AOE ("ULAE")	6.3%	100%
Subtotal	42.1%	
Miscellaneous Income	0.27%	0%
Other Operating Expenses	0.1%	0%
Interest Expense	0.7%	

TABLE 4: Key Target Results After Iteration

Final Direct Combined Ratio	98.2%
Direct Profit & Contingencies Provision	1.8%

TABLE 5: Internal Rate of Return Analysis

Year	Quarter	Underwriting Income						Surplus				Average Investible Assets	Investment Income			Equity Flow
		Tax Rate: 21.0%						R/S:	4.50	P/S:	2.16		BT yield	Tax	AT yield	
		PreTax	Change in Tax Reserves	Misc Income	Taxable Income	Tax	Net	UEPR + Loss Resv	Required Surplus		Chg		3.7%	21.0%	2.9%	
									End	Avg			Amt	Tax	Net	
0	0	(220)	-		4		(220)	1,120	249		249	-				(469)
1	1	58	155	1	12	3	55	992	220	235	(28)	468	4	1	3	87
1	2	58	155	1	11	2	56	851	189	205	(31)	604	6	1	4	92
1	3	58	156	1	11	2	56	701	156	172	(33)	726	7	1	5	95
1	4	58	156	1	10	2	56	544	121	138	(35)	750	7	1	5	97
2	1	-	6		(6)	(1)	1	507	113	117	(8)	682	6	1	5	14
2	2	-	2		(2)	(0)	0	476	106	109	(7)	626	6	1	5	12
2	3	-	2		(2)	(0)	0	445	99	102	(7)	586	5	1	4	12
2	4	-	2		(2)	(0)	0	412	92	95	(7)	545	5	1	4	12
3	1	-	4		(4)	(1)	1	379	84	88	(7)	502	5	1	4	12
3	2	-	2		(2)	(0)	0	344	76	80	(8)	459	4	1	3	11
3	3	-	2		(2)	(0)	0	309	69	73	(8)	415	4	1	3	11
3	4	-	2		(2)	(0)	0	275	61	65	(8)	371	3	1	3	11
4	1	-	2		(2)	(0)	0	242	54	58	(7)	329	3	1	2	10
4	2	-	2		(2)	(0)	0	211	47	50	(7)	288	3	1	2	9
4	3	-	1		(1)	(0)	0	182	40	44	(6)	250	2	0	2	9
4	4	-	1		(1)	(0)	0	155	34	37	(6)	214	2	0	2	8
5	4	-	4		(4)	(1)	1	74	17	26	(18)	146	5	1	4	23
6	4	-	2		(2)	(0)	0	32	7	12	(10)	67	2	1	2	12
7	4	-	1		(1)	(0)	0	15	3	5	(4)	29	1	0	1	5
8	4	-	0		(0)	(0)	0	6	1	2	(2)	13	0	0	0	2
9	4	-	0		(0)	(0)	0	2	0	1	(1)	5	0	0	0	1
10	4	-	0		(0)	(0)	0	1	0	0	(0)	2	0	0	0	0
11	4	-	0		(0)	(0)	0	0	0	0	(0)	1	0	0	0	0
12	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
13	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
14	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
15	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
16	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
17	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
18	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
19	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
20	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
21	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
22	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
23	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
24	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
25	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
26	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
27	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
28	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
29	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
30	4	-	0		(0)	(0)	0	0	0	0	(0)	0	0	0	0	0
Total		10	3	13	3	10	8,277						82	17	65	

Average Reserve Balance

2,167

463

2,218

NPV @ 13.0%

UW Income (5)

Inv Income 51

- Surplus (46)

Total 0

The Hanover Insurance Group Internal Rate of Return Calculation

Commercial Auto Physical Damage

TABLE 1: Key Target Inputs

Target ROE	13.0%
Premium-to-Surplus	6.28
Reserve-to-Surplus	3.68
Tax Rate	21.0%
Pre-Tax Investment Yield	3.7%
Initial Premium	1,000
Net-to-Direct Ratio	99.7%

TABLE 2: Loss Ratio Inputs

Expected Ex Cat Loss Ratio	58.1%
Expected Cat Ratio	4.8%
DCCE (% loss)	0.6%

TABLE 5: Internal Rate of Return Analysis

Time Period					Premium					Expenses Incl. AOE			Losses + DCCE Including Catastrophes						
Year	Quarter	Mid	NPV Factor @ 13.0%	IRS Discount Factor	Written		Earned			Inc'd	Paid	Resv	Case Incurred		Paid		Loss & DCCE Reserve		
					Collected	Rcvble		Unearned Premium Reserve					%	\$	%	\$	End	Avg	
								End	Avg										
0	0	0	1.00	1.00	1,108	13%	963	1,108		215	215		%	\$	%	\$	End	Avg	
1	1	1/8	0.98	0.98		26%	679	277	831	970	58	49	9	25%	158	17%	111	48	24
1	2	3/8	0.96	0.98		26%	394	277	554	693	58	52	16	25%	158	25%	160	46	47
1	3	5/8	0.93	0.98		26%	111	277	277	416	58	52	23	25%	158	25%	158	46	46
1	4	7/8	0.90	0.98		10%		277		139	58	52	30	25%	158	25%	158	47	47
2	1	1 1/8	0.87	0.97		0%					28	1	1			10%	65	(18)	14
2	2	1 3/8	0.85	0.97		0%					1	1				-1%	-5	(13)	(16)
2	3	1 5/8	0.82	0.97		0%					1	0				-1%	-5	(9)	(11)
2	4	1 7/8	0.80	0.97		0%					1	-0				-1%	-3	(5)	(7)
3	1	2 1/8	0.77	0.98		0%					(0)	-0				0%	-1	(4)	(5)
3	2	2 3/8	0.75	0.98		0%					(0)	-0				0%	-1	(3)	(4)
3	3	2 5/8	0.73	0.98		0%					(0)	-0				0%	-1	(2)	(3)
3	4	2 7/8	0.70	0.98		0%					(0)	-0				0%	-1	(1)	(2)
4	1	3 1/8	0.68	0.98		0%					(0)	-0				0%	-0	(1)	(1)
4	2	3 3/8	0.66	0.98		0%					(0)	-0				0%	-0	(1)	(1)
4	3	3 5/8	0.64	0.98		0%					(0)	-0				0%	-0	(1)	(1)
4	4	3 7/8	0.62	0.98		0%					(0)	-0				0%	-0	(1)	(1)
5	4	4 1/2	0.58	0.98		0%					(0)	-0				0%	-1	(0)	(0)
6	4	5 1/2	0.51	0.98		0%					(0)	0				0%	-0	0	(0)
7	4	6 1/2	0.45	0.98		0%					0	-0				0%	0	(0)	0
8	4	7 1/2	0.40	0.98		0%					-	-0				0%		(0)	(0)
9	4	8 1/2	0.35	0.98		0%					-	-0				0%		(0)	(0)
10	4	9 1/2	0.31	0.98		0%					-	-0				0%		(0)	(0)
11	4	10 1/2	0.28	0.98		0%					-	-0				0%		(0)	(0)
12	4	11 1/2	0.25	0.98		0%					-	-0				0%		(0)	(0)
13	4	12 1/2	0.22	0.98		0%					-	-0				0%		(0)	(0)
14	4	13 1/2	0.19	0.98		0%					-	-0				0%		(0)	(0)
15	4	14 1/2	0.17	0.98		0%					-	-0				0%		(0)	(0)
16	4	15 1/2	0.15	0.98		0%					-	-0				0%		(0)	(0)
17	4	14 1/2	0.17	0.98		0%					0	-0				0%	0	(0)	(0)
18	4	17 1/2	0.12	0.98		0%					0	-0				0%	0	(0)	(0)
19	4	18 1/2	0.10	0.98		0%					0	-0				0%	0	(0)	(0)
20	4	19 1/2	0.09	0.98		0%					0	-0				0%	0	(0)	(0)
21	4	20 1/2	0.08	0.98		0%					0	-0				0%	0	(0)	(0)
22	4	21 1/2	0.07	0.98		0%					0	-0				0%	0	(0)	(0)
23	4	22 1/2	0.06	0.98		0%					0	-0				0%	0	(0)	(0)
24	4	23 1/2	0.06	0.98		0%					0	-0				0%	0	(0)	(0)
25	4	24 1/2	0.05	0.98		0%					0	-0				0%	0	(0)	(0)
26	4	25 1/2	0.04	0.98		0%					0	-0				0%	0	(0)	(0)
27	4	26 1/2	0.04	0.98		0%					0	-0				0%	0	(0)	(0)
28	4	27 1/2	0.03	0.98		0%					0	-0				0%	0	(0)	(0)
29	4	28 1/2	0.03	0.98		0%					0	-0				0%	0	(0)	(0)
30	4	29 1/2	0.03	0.98		0%					-	-0				0%		(0)	(0)
Total					1,108	100%		1,108			449	449		100%	633	100%	633		

Average Reserve Balance		(416)		693	554		20		32	31
Average Weighted Life	0.38		0.50		0.30	0.61		0.55		0.05

The Hanover Insurance Group Internal Rate of Return Calculation

Commercial Auto Physical Damage

TABLE 3: Expense / Misc Income Inputs

	% of prem	% fixed
Commissions	14.5%	0%
Contingent Commissions	2.2%	0%
Premium Tax	2.3%	0%
General Expenses	11.2%	50%
Other Acquisitions	5.6%	50%
Dividends	0.0%	0%
Reinsurance	0.0%	100%
AOE ("ULAE")	6.2%	100%
Subtotal	41.9%	
Miscellaneous Income	0.27%	0%
Other Operating Expenses	0.1%	0%
Interest Expense	0.2%	

TABLE 4: Key Target Results After Iteration

Final Direct Combined Ratio	97.3%
Direct Profit & Contingencies Provision	2.7%

TABLE 5: Internal Rate of Return Analysis

Year	Quarter	Underwriting Income						Surplus				Average Investible Assets	Investment Income			Equity Flow
		Tax Rate: 21.0%						R/S: 3.68		P/S: 6.28			BT yield	Tax	AT yield	
		PreTax	Change in Tax Reserves	Misc Income	Taxable Income	Tax	Net	UEPR + Loss Resv	Required Surplus		Chg		3.7%	21.0%	2.9%	
									End	Avg			Amt	Tax	Net	
0	0	(215)	-		6		(215)	1,108	301		301	-				(517)
1	1	60	157	1	7	3	58	879	239	270	(62)	448	4	1	3	124
1	2	60	158	1	6	1	60	601	163	201	(76)	417	4	1	3	139
1	3	60	158	1	6	1	60	323	88	126	(75)	354	3	1	3	138
1	4	60	158	1	6	1	60	47	13	50	(75)	206	2	0	2	137
2	1	-	1		(1)	(0)	0	(18)	(5)	4	(18)	34	0	0	0	18
2	2	-	(0)		0	0	(0)	(13)	(4)	(4)	1	(19)	(0)	(0)	(0)	(1)
2	3	-	(0)		0	0	(0)	(9)	(2)	(3)	1	(14)	(0)	(0)	(0)	(1)
2	4	-	(0)		0	0	(0)	(5)	(1)	(2)	1	(9)	(0)	(0)	(0)	(1)
3	1	-	(0)		0	0	(0)	(4)	(1)	(1)	0	(6)	(0)	(0)	(0)	(0)
3	2	-	(0)		0	0	(0)	(3)	(1)	(1)	0	(5)	(0)	(0)	(0)	(0)
3	3	-	(0)		0	0	(0)	(2)	(1)	(1)	0	(4)	(0)	(0)	(0)	(0)
3	4	-	(0)		0	0	(0)	(1)	(0)	(0)	0	(2)	(0)	(0)	(0)	(0)
4	1	-	(0)		0	0	(0)	(1)	(0)	(0)	0	(2)	(0)	(0)	(0)	(0)
4	2	-	(0)		0	0	(0)	(1)	(0)	(0)	0	(1)	(0)	(0)	(0)	(0)
4	3	-	(0)		0	0	(0)	(1)	(0)	(0)	0	(1)	(0)	(0)	(0)	(0)
4	4	-	(0)		0	0	(0)	(1)	(0)	(0)	0	(1)	(0)	(0)	(0)	(0)
5	4	-	(0)		0	0	(0)	(0)	(0)	(0)	0	(0)	(0)	(0)	(0)	(0)
6	4	-	(0)		0	0	(0)	0	0	(0)	0	(0)	(0)	(0)	(0)	(0)
7	4	-	0		(0)	(0)	0	(0)	(0)	0	(0)	0	0	0	0	0
8	4	-	-		-	-	-	(0)	(0)	(0)	-	(0)	(0)	(0)	(0)	(0)
9	4	-	-		-	-	-	(0)	(0)	(0)	-	(0)	(0)	(0)	(0)	(0)
10	4	-	-		-	-	-	(0)	(0)	(0)	-	(0)	(0)	(0)	(0)	(0)
11	4	-	-		-	-	-	(0)	(0)	(0)	-	(0)	(0)	(0)	(0)	(0)
12	4	-	-		-	-	-	(0)	(0)	(0)	-	(0)	(0)	(0)	(0)	(0)
13	4	-	-		-	-	-	(0)	(0)	(0)	-	(0)	(0)	(0)	(0)	(0)
14	4	-	-		-	-	-	(0)	(0)	(0)	-	(0)	(0)	(0)	(0)	(0)
15	4	-	-		-	-	-	(0)	(0)	(0)	-	(0)	(0)	(0)	(0)	(0)
16	4	-	-		-	-	-	(0)	(0)	(0)	-	(0)	(0)	(0)	(0)	(0)
17	4	-	0		(0)	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
18	4	-	0		(0)	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
19	4	-	0		(0)	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
20	4	-	0		(0)	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
21	4	-	0		(0)	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
22	4	-	0		(0)	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
23	4	-	0		(0)	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
24	4	-	0		(0)	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
25	4	-	0		(0)	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
26	4	-	0		(0)	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
27	4	-	0		(0)	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
28	4	-	0		(0)	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
29	4	-	0		(0)	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
30	4	-	-		-	-	-	(0)	(0)	(0)	-	(0)	(0)	(0)	(0)	(0)
Total		26		3	29	6	23	2,898					13	3	10	

Average Reserve Balance

724

159

348

NPV @ 13.0%

UW Income	9
Inv Income	10
- Surplus	(19)
Total	(0)

Inforce Actual Written Premium by Coverage used in Calculation of Rate Effects

<u>Coverage</u>	<u>Written Premium</u>
Collision	\$461,667
Comprehensive	\$219,946
Liability	\$1,115,290
No Fault	\$4,236
UM/UIM	\$123,692

Earned Exposures by Coverage/Accident Year

<u>Acc Year</u>	<u>Coverage</u>	<u>Earned Exposure - Car Years</u>
2018	Liability	932.5
2018	Physical Damage	1006.3
2018	PIP	864.8
2017	Liability	824.2
2017	Physical Damage	878.6
2017	PIP	783.9
2016	Liability	779.9
2016	Physical Damage	833.7
2016	PIP	743.0
2015	Liability	714.9
2015	Physical Damage	763.3
2015	PIP	679.0
2014	Liability	640.3
2014	Physical Damage	673.8
2014	PIP	608.9

**The Hanover Insurance Company (HI)
Massachusetts Bay Insurance Company (MB)
The Hanover American Insurance Company (Han)
Commercial Automobile
District of Columbia**

Explanatory Memorandum

The companies above hereby file revisions to our Commercial Automobile line of business effective March 1, 2020 for new and renewal business. The overall estimated rate impact is +2.2%.

The following revisions are proposed:

1. Loss Costs
2. Hired Auto Minimum Premium
3. Non-Ownership Liability
4. Business Auto Coverage Broadening Endorsement Class Code Correction

Below are detailed descriptions of each proposed change:

1. *Loss Costs*

With this filing, we are changing our proprietary loss costs for PPT, TTT, Public, and Hired Auto vehicle types. These loss costs will mirror those filed in ISO reference filing CA-2019-BRLA1. Please see Appendix A for more details. In addition, the company loss cost modifiers are being revised in this filing.

2. *Hired Auto Minimum Premium*

With this filing, we are increasing the minimum premiums for Hired Auto liability coverage from \$75 to \$100 and the physical damage coverage from \$25 to \$50. Please see the state exception pages for more information.

3. *Non-Ownership Liability*

With this filing, we wish to adopt the ISO Rule 89. Non-Ownership Liability Loss Costs. However, due to system limitations, we cannot breakout the 0-25 category into three separate categories as ISO has implemented in CA-2019-BRLA1. Therefore, we propose to use the average loss costs of ISO's three categories (0-9, 10-19 and 20-25) as our single 0-25 loss cost. Arithmetically, this is $(64+135+218)/3 = 139$. Please see the attached exception pages displaying this proposed loss cost.

4. *Business Auto Coverage Broadening Endorsement Class Code Correction*

This is an editorial only update. We found that our state exception pages were incorrectly displaying the class code 9900 for the Business Auto Broadening Endorsement. This has been corrected to the class code 9990, and can be seen in the state exception pages with this filing. The change has no implications to rating.

Actuarial Indications Methodology

Overall Approach: The companies use a credibility weighted loss ratio approach to ratemaking. Statewide data is used as much as possible. When statewide data is not available, countrywide data is used in its place. The underlying experience is the most recent direct (before reinsurance) calendar/accident year data.

Premium: Earned premium is compiled on a calendar year basis.

On-Level Premiums: Premiums are adjusted to the current rate level by using the parallelogram method.

Premium Trend: Physical Damage premium is adjusted to reflect shifts in original cost new (OCN) exposures from the mid-point of each calendar year to one year past the effective date. We rely on exposure data contained in the latest approved Insurance Services Office (ISO) Commercial Auto Loss Cost filing, typically published annually.

Losses: Losses are direct incurred losses limited to \$250,000 per claim occurrence and excluding catastrophes. Incurred losses are net of salvage and subrogation and do not include any loss adjustment expenses. The incurred losses are for 12 month accident year periods.

Loss Development: Loss development factors are based on the latest 15 accident years of loss data. Losses underlying the LDFs are on the same basis as the losses above (i.e. incurred, limited to \$250,000 per claim, excluding catastrophes, net as to salvage and subrogation, and exclusive of all loss adjustment expenses. Loss Development Triangles evaluated as of year-end were used to calculate LDFs for ages 12 to ultimate, 24 to ultimate, 36 to ultimate, 48 to ultimate, etc. The reciprocal of the loss development factors were then interpolated using standard interpolation techniques to find the loss development factors used in the indication, for ages 18 to ultimate, 30 to ultimate, 42 to ultimate, 45 to ultimate, and 66 to ultimate.

LAE Load: The LAE Load is a countrywide factor which reflects all loss adjustments expenses (LAE), i.e. both defense cost containment expenses and other adjustment expenses. LAE based on countrywide Commercial Auto data developed from the Insurance Expense Exhibit (IEE). The LAE load is expressed as a percentage of earned premiums.

Loss Trend: Factors to adjust incurred losses to reflect changes in loss frequency and severity from the mid-point of each year of the experience period to one year past the proposed effective date. We have relied on the loss trend data contained in the ISO Commercial Auto Loss Cost reference filing for our trend selections.

Excess Loss Factor: Liability losses in excess of \$250,000 are considered in the excess loss factor. The excess loss factor is calculated based on 3 years of statewide historical losses that are developed to ultimate and the corresponding 3-year historical direct earned premium. The excess loss factor is expressed as a percent of premium.

Excess Wind and Water Load: ISO uses an excess wind and water procedure to smooth out catastrophe losses for Comprehensive (OTC) coverage. Since ISO has a much larger and credible database than we do, we feel that it is not necessary to make independent adjustments to this procedure. We use the same Excess Wind and Water methodology that ISO uses in their Loss Cost Circulars, the only exception being that we calculate the load for all vehicles combined rather than by vehicle type. The Comprehensive (OTC) Excess Wind and Water Load is also converted to a physical damage Excess Wind and Water Load by multiplying the load by the percent of physical damage losses that are Comprehensive, which is selected based off of the latest three years of The Hanover Insurance Group's physical damage experience. The analysis uses data contained in the ISO Commercial Auto Loss Cost filing, published annually. The excess wind and water load is expressed as a percent of losses.

Accident Year Weights: We judgmentally selected accident year weights that balance the responsiveness and stability of our data.

Credibility Method: We use a credibility approach to reflect the amount of weight to be applied to the statewide data as it relates to its predictive value. It is equal to: $P / (P + K)$ where P = the five-year collected earned premiums and K = \$20,000,000 for Liability and No-Fault and \$2,000,000 for physical damage.

Development of Expected Fixed and Variable Expense Ratios: This is shown in Exhibit 1 – State Indication. Components are developed as follows:

- General and Other Acquisition Expenses use Countrywide IEE figures. General Expenses are considered 75% fixed and 25% variable. Other Acquisition Expenses are considered 33% fixed and 67% variable.
- Commissions and Taxes, Licenses and Fees use state P.14 figures. Both of these ratios are considered variable, as they are directly proportional to written premium.
- Profit and Contingencies, including Investment Income: We use an internal rate of return (IRR) model to determine the profit and contingencies provision after reflection of investment income. The IRR is the expected rate of return generated from modeling insurance company operations. Inputs to the model are shown in Exhibit 2 – IRR Model Memo & Exhibits, Tables 1, 2 and 3. The modeled results are shown in Tables 5. Table 4 shows the final direct profit and contingencies provision.

Rate Level Impact Methodology

The overall estimated rate level effect was calculated using current inforce policies. Each policy was rated using current rates and rating factors. Each policy was then re-rated with the proposed rates. Premiums were then compared to each other to develop the overall rate level impact.

State Exception Pages

Enclosed are the revised state exception pages and Appendix A - DC Proprietary Loss Cost Pages.